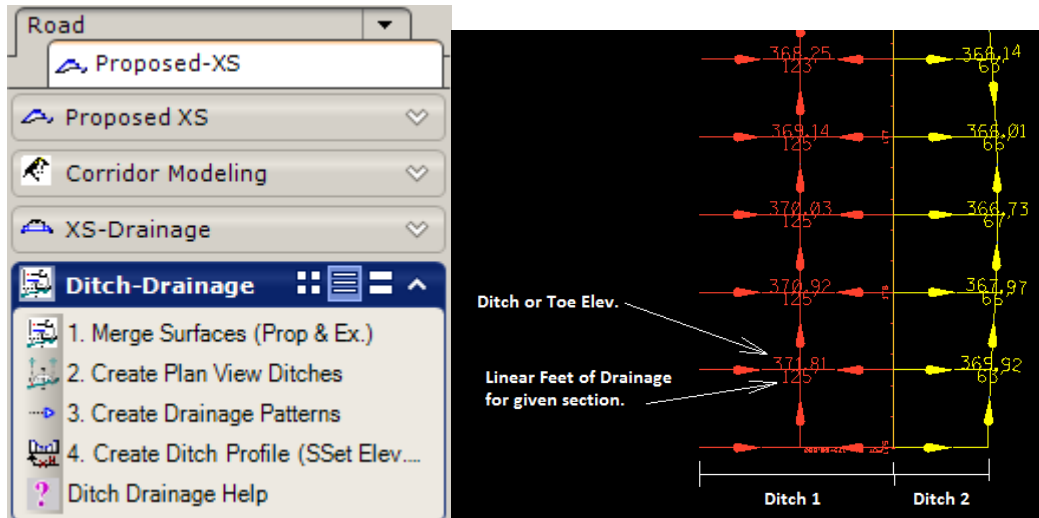


# Ditch Flow Patterns (3-1-2011)



**NOTE:** You may want to make a copy of your x-section file and perform this work because elements are added to the XS file. Example: Copy xs471.dgn to xs471drain.dgn

## 1) Merge the Existing & Proposed Ground

Invoke Geopak's Multi-Line XS Report and fill out as shown below.

Tag APPLY to merge the Proposed Ground with the Existing Ground. The resulting merged surface is on LV=55(XS\_X\_MULTI), CO=3, WT=4, LC=3 and should follow the existing ground exactly up to the proposed ground where it should follow the proposed ground exactly.

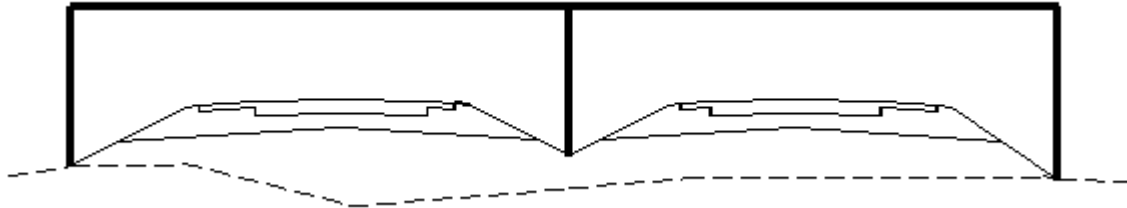
The screenshot shows the 'Multi-Line Report' dialog box. The 'File' section includes 'Job' (471), 'Chain' (H471), 'Beg Sta' (175+00.00 R 1), 'End Sta' (203+50.00 R 2), and 'Cur Sta' (175+00). The 'XS Elements' section contains a table with the following data:

Level	Lv Name	Color	Weight	Style	Lb	T/B	Lv	Co	Wt	LC	P/S
	XS_P_FINISHED_GRADE	ByLevel			B	B	XS_M_MULTI	3	4	3	P
	XS_X_GROUND	ByLevel			B	B	XS_M_MULTI	3	4	3	S

The 'XS Elements' section also includes a 'Display' button, a 'Label' dropdown (set to 'B'), and a 'Bottom' dropdown. The 'Output Format' is set to 'Multi'. The 'ASCII File' is 'xs471.mlt'. The 'Cur Sta' is '175+00'. The 'Apply' button is at the bottom.

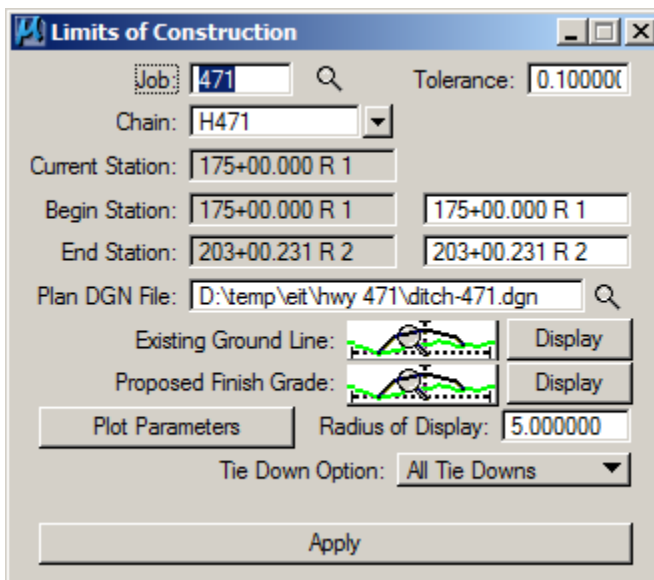
## 2. Create Plan View Lines THAT REPRESENT YOUR DITCH.

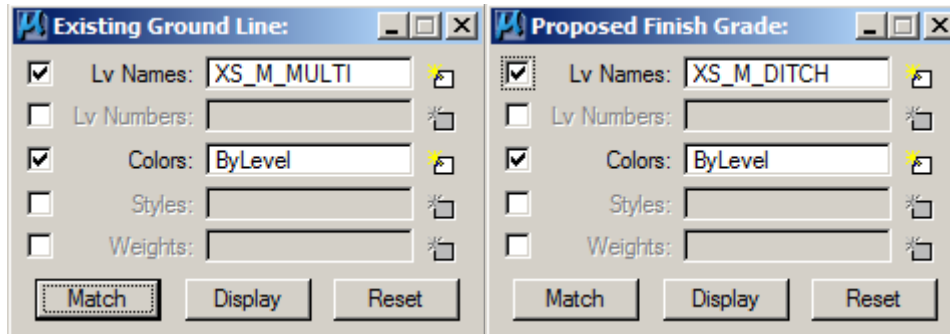
\* Ensure the lines which connect ditches are present after running the templates.



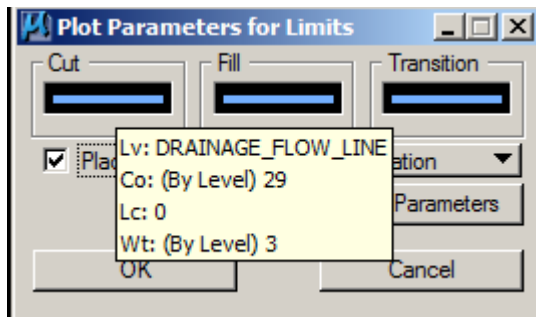
\* To get the plan view location follow these steps:

- Create a file called DITCH-chainname.dgn
- Enter your working x-section file.
- Invoke Geopak's LIMIT OF CONSTRUCTION dialog application shown below.



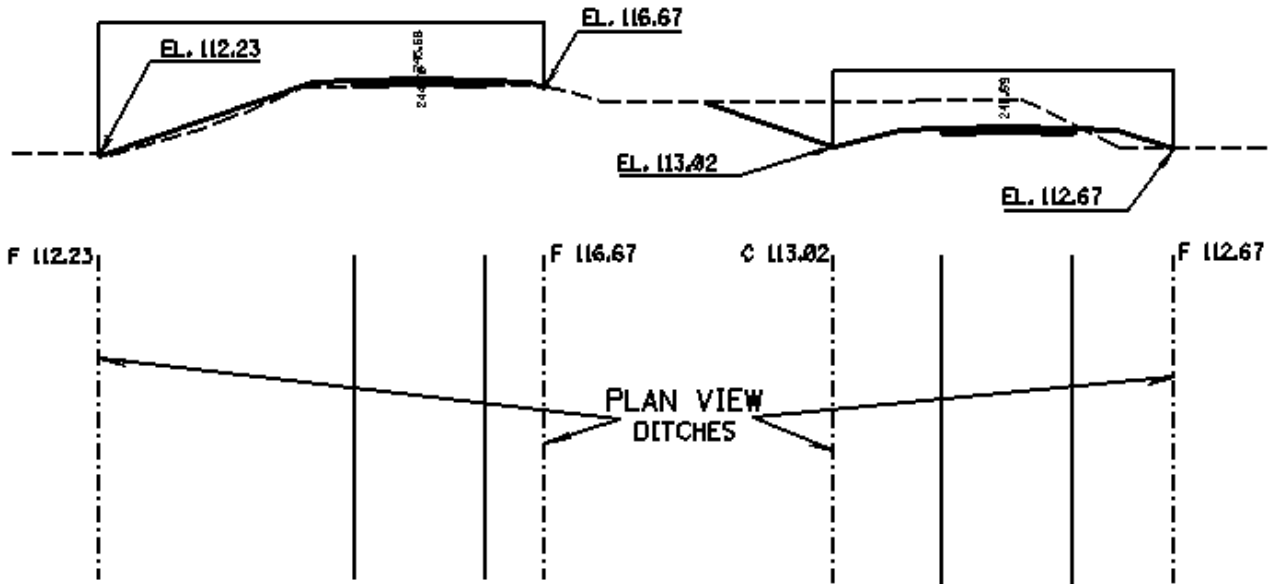


d. Tag on PARAMETERS and Invoke the dialog application show below. **Make sure LC is set to 0.**



e. TAG OK, THEN APPLY on the Limits of Construction Dialog.

The Diagram below shows the lines that are drawn on the proposed sections. They help determine the Plan View location of Ditches in cut and the Toe of Slope in a Fill.

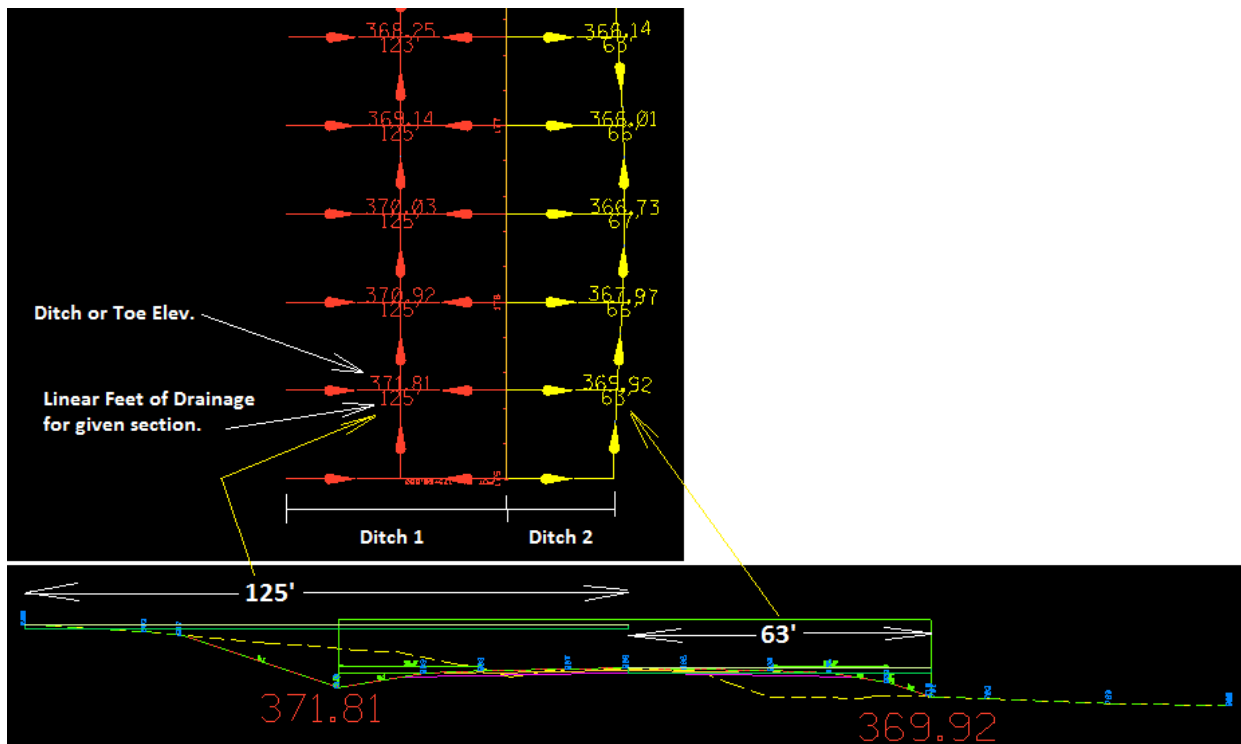


### 3. Draw Plan View Ditch Flow Patterns

This step creates a Proposed X-section input file that when ran, draws Drainage Flow Patterns as shown in the image below.

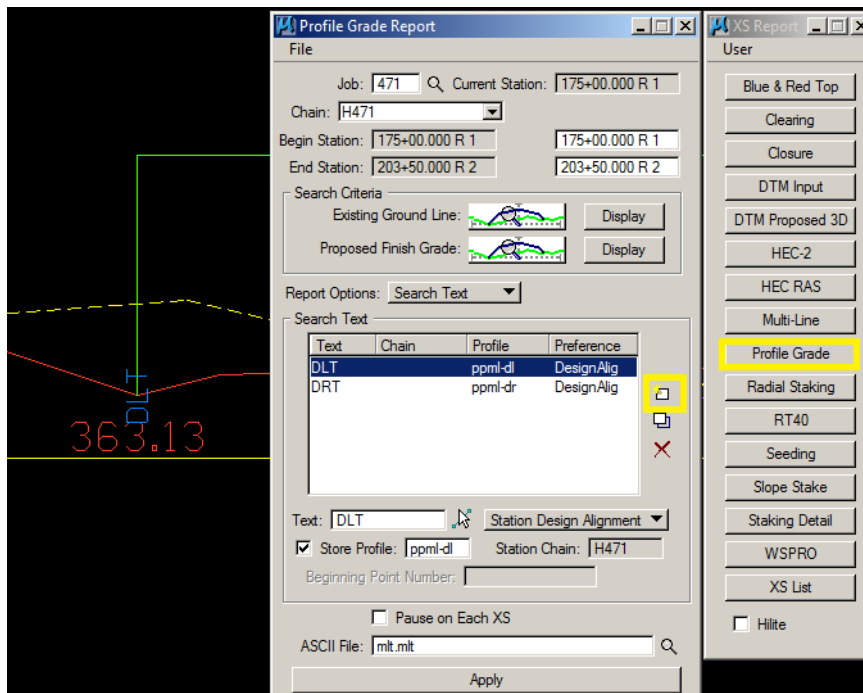
Notes:

- a) You could run/reference your limits of construction to help you know when you're in a Cut Section.
- b) Graphics are also added to the x-section DGN file. One is a horizontal rectangle that represents the drainage area to a ditch. The other is a piece of text at each ditch or fill tie location. These pieces of text can be used to create a profile of the existing ditch which can be plotted and then modified to drain.
- c) This Input file will handle up to 8 ditch lines on one x-section.



#### 4. Create Ditch Profiles (Required for the next section, Drain X-Section Ditches).

The step above places unique text at each ditch location (See blue text below). You can use GeoPak's Profile Grade x-section report to create GPK stored profiles which you can plot and modify to drain. Fill in the dialog as shown below. Below is an example if 2 ditches are on a set of x-sections.



For cases where there are more than 2 ditches, you should run for station ranges where there are the same number of ditches to create the profiles meaning you would run for different station ranges if some sections had more/less ditches. You should also view ditch text to see what the text is but it will always be (from the left ditch to right) DLT,D2,D3,D4,D5,D6,DRT with DLT being the furthest ditch to the left & DRT being the furthest ditch to the right. Below is an example of 4 roadways and 8 ditches. Notice the Station limits go only through sections where there are 4 roadways or 8 ditches.

